



# Adiponectin

CPT Code **83520\***

Order Code **C314**

Specimen Type **Serum**

Tube Type **Tiger Top**

## Decreased adiponectin levels are associated with:

- Metabolic syndrome
- Type 2 diabetes
- Coronary artery disease (CAD)

## Adiponectin levels can be increased by:

- Weight loss
- Exercise
- Certain diabetes medications

## Description

Adiponectin is an abundant hormone released by adipocytes (fat cells), commonly referred to as an adipokine. Adiponectin plays a large metabolic role in the body, participating in the regulation of glucose levels, insulin sensitivity, and lipid catabolism. Adiponectin also helps support proper endothelial functioning<sup>1,2</sup> and has multiple anti-inflammatory properties,<sup>1-3</sup> including inhibition of the transformation of macrophages into foam cells,<sup>4</sup> which is one of the first steps of atherosclerosis.

Unlike other adipokines, adiponectin levels are lower in obese individuals.<sup>2,5</sup> As adipocytes become larger with weight gain, they release less adiponectin.<sup>6</sup> Among healthy individuals, women typically have higher adiponectin levels than men.<sup>5</sup>

## Clinical Use

Adiponectin testing may be performed on individuals at risk of metabolic syndrome or diabetes due to poor lifestyle choices.

## Clinical Significance

- Individuals with low adiponectin levels have a 3X greater risk of developing metabolic syndrome.<sup>7</sup>
- Men with two or more risk factors for metabolic syndrome and high adiponectin levels are half as likely to develop metabolic syndrome as men with low adiponectin levels.<sup>8</sup>
- Individuals with low levels of adiponectin are up to 9X as likely to develop type 2 diabetes.<sup>9</sup>
- Individuals with low adiponectin levels have a 2X increase in the prevalence of CAD.<sup>10</sup>

## Testing Frequency

Adiponectin testing is determined by an individual's medical history, but may be performed semi-annually or annually as necessary. If the initial test result is abnormal, then follow-up testing may be performed within 3-6 months following treatment.

## Specimen Type

The adiponectin test should be performed on a serum sample.

## Commercial Insurance or Medicare Coverage

Coverage guidelines have not been established or posted by CMS (Medicare & Medicaid). We have reviewed the larger carriers (Aetna, United Healthcare, Cigna, Blues) and information is limited or has not been posted.

## RELATIVE RISK

Adiponectin  
( $\mu\text{g/mL}$ )

Weight Classification	Body Mass Index ( $\text{kg/m}^2$ )	ADIPONECTIN LEVELS ( $\mu\text{g/mL}$ )	
		Men	Women
Underweight/Normal	<25	4-26	5-37
Overweight	25-30	4-20	5-28
Obese	>30	2-20	4-22

### Treatment Considerations<sup>†</sup>

These treatment considerations are for educational purposes only. Specific treatment plans should be provided and reviews by the treating practitioner.

✓ **Assess lifestyle habits.**

- Consider diet/exercise/weight reduction efforts as appropriate.<sup>11,12</sup>

✓ **Assess HDL-C levels.**

- If not at an optimal level,<sup>11</sup> consider nicotinic acid or omega-3 fatty acids.

✓ **Assess insulin sensitivity.**

- If not at an optimal level,<sup>6-9</sup> consider insulin-sensitizing therapies described in the American Diabetes Association guidelines for the management of pre-diabetes/diabetes.<sup>13</sup>

\* The CPT codes provided are based on AMA guidelines and are for informational purposes only. CPT coding is the sole responsibility of the billing party. Please direct any questions regarding coding to the payer being billed.

† The treatment considerations are provided for informational purposes only and are not intended as medical advice. A physician's test selection and interpretation, diagnosis, and patient management decisions should be based on his/her education, clinical expertise, and assessment of the patient.

### References

1. Okamoto Y, Arita Y, Nishida M, et al. An Adipocyte-Derived Plasma Protein, Adiponectin, Adheres to Injured Vascular Walls. *Horm Metab Res.* 2007; 32 (2): 47-50.
2. Ouchi N, Kihara S, Arita Y, et al. Novel Modulator for Endothelial Adhesion Molecules Adipocyte-Derived Plasma Protein Adiponectin. *Circulation.* 1999; 100: 2473-2476.
3. Ouchi N, Kihara S, Arita Y, et al. Adiponectin, an adipocyte-derived plasma protein, inhibits endothelial NF-kappaB signaling through a cAMP-dependent pathway. *Circulation.* 2000; 102 (11): 1296-301.
4. Ouchi N, Kihara S, Arita Y, et al. Adipocyte-Derived Plasma Protein, Adiponectin, Suppresses Lipid Accumulation and Class A Scavenger Receptor Expression in Human Monocyte-Derived Macrophages. *Circulation.* 2001; 103: 1057-1063.
5. Arita Y, Kihara S, Ouchi N, et al. Paradoxical Decrease of an Adipose-Specific Protein, Adiponectin, in Obesity. *Biochem Biophys Res Commun.* 1999; 257: 79-83.
6. Hoffstedt J, Arvidsson E, Sjölin, Wåhlén, Arner P. Adipose Tissue Adiponectin Production and Adiponectin Serum Concentration in Human Obesity and Insulin Resistance. *J Clin Endocrinol Metab.* 2004; 89 (3): 1391-1396.
7. Chen SJ, Yen C-H, Lee B-J, Hsia S, Lin P-T. Relationships between inflammation, adiponectin, and oxidative stress in metabolic syndrome. *PLoS ONE.* 2012; 7: e45693.
8. Kotooka N, Komatsu A, Takahashi H, et al. Predictive value of high-molecular weight adiponectin in subjects with a higher risk of the development of metabolic syndrome: From a population based 5-year follow-up data. *Int J Cardiol.* 2012 Nov 26. pii: S0167-5273(12)01441-6. doi: 10.1016/j.ijcard.2012.10.066. [Epub ahead of print].
9. Daimon M, Oizumi T, Saitoh T, et al. Decreased serum levels of adiponectin are a risk factor for the progression to type 2 diabetes in the Japanese population. *Diabetes Care.* 2003; 26: 2015-2020.
10. Kumada M, Kihara S, Sumitsuji S, et al. Association of hypoadiponectinemia with coronary artery disease in men. *Arterioscler Thromb Vasc Biol.* 2003; 23: 35-39.
11. Belalcazar LM, Lang W, Haffner SM, et al. Adiponectin and mediation of HDL-cholesterol change with improved lifestyle: The Look AHEAD Study. *J Lipid Res.* 2012; 53: 2726-2733.
12. Belalcazar LM, Lang W, Haffner SM, et al. Improving adiponectin levels in individuals with diabetes and obesity: Insights from Look AHEAD. *Diabetes Care.* 2015; 38: 1544-1550.
13. American Diabetes Association: Standards of Medical Care in Diabetes-2018. *Diabetes Care.* 2018; 41(Supplement 1).

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